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EXAMINER	
KADING, JOSHUA A	

ART UNIT	PAPER NUMBER
2661	10

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/679,138	Applicant(s) HILL ET AL.	
	Examiner Joshua Kading	Art Unit 2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5,8-18,21,22 and 25-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8-11 and 25-28* is/are allowed.

6)☒ Claim(s) *1, 4, 5, 12-18, 21, 22, and 29-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 October 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:
Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c).

For inventor Rex Hill, the written address of the originally filed Oath and Declaration is not initialed and/or dated.

It does not identify the mailing address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

For inventor Bryan Dietz there is not mailing address.

Claim Objections

Claim 14 is objected to because of the following informalities:

Claim 14, line 14 states "the associated subtuple". There is no antecedent basis for this, therefore it should be changed to --the associated portion of the tuple-- to be consistent with the rest of the claim language.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 4, 14-18, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin (U.S. Patent 6,052,683) in view of Emery et al. (U.S. Patent 5,530,854).

In regard to claim 1, Irwin discloses "a method for determining packet processing data, comprising the steps of:

receiving a packet (col. 10, line 66 where the incoming destination address means that a packet, as described in Table A1 in col. 3, was received);

forming a plurality of subtuples for the packet from flow properties associated with the packet (col. 3, Table A1 where some fields descriptive about the flow properties of the packet such as destination address, source address, etc. can be considered tuples and the different bytes of the destination address, for example, can be considered subtuples);

applying one or more of the subtuples as respective inputs to [a] respective one or more lookups (col. 10, lines 66-67 and col. 11, line 1 where the first byte of the destination lookup is a subtuple applied to the binary tree or lookup)...

returning packet processing data as an output from at least one of the lookups (col. 11, lines 2-5 where the list that is generated contains information on packet processing)."

However, Irwin lacks what Emery discloses, "...returning a nickname as an output from at least one of the lookups (figure 4, element 415 and 420 are combined to be the nickname returned from the first lookup), wherein the nickname has a lower bit count than the associated subtuple (figure 4, where since element 415 is null and is thus empty, the returned nickname only consists of element 420, which makes the nickname smaller than the subtuple (element 430) used to access the lookup); and applying the nickname as an input to at least one of the lookups (figure 4, where the nickname (415 and 420) are used to access the next lookup in the sequence)..."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the lower bit count nickname and applying the nickname to another lookup in another stage with the rest of the method for the purpose of having higher memory utilization. The motivation for having higher memory utilization leads to a reduction in search time and complexity (Emery, col. 7, lines 55-58).

In regard to claim 4, Irwin and Emery disclose the method according to claim 1. However, Emery lacks what Irwin further discloses, "fewer than all of the plurality of subtuples are applied as the respective inputs to the respective lookups (col. 10, lines 66-67 and col. 11, line 1 where not all of the subtuples are applied to the lookups, in this instance only the first two bytes or subtuples of the destination address are applied)." It would have been obvious to one with ordinary skill in the art at the time of invention to have not all of the subtuples

applied to the inputs of the lookups with the method of claim 1 for the same reasons and motivation as in claim 1.

In regard to claim 14, Irwin discloses "a switching interface for a data communication switch, comprising:

an access controller having a port for receiving a packet (col. 10, line 66 where the incoming destination address means that a packet, as described in Table A1 in col. 3, was received and in order for the packet to be received there must be a port); and

a switching engine coupled to the access controller (figure 6 shows an access controller 70 which is part of, and thus coupled, to the entire switching (routing) engine 60), the switching engine adapted to:

receive the packet from the access controller (figure 6, packet 80 is being received by element 66),

determine a tuple for the packet including a plurality of flow properties (figure 6, elements n1.n2 are the portions of the tuple of the packet which include flow properties such as addresses),

transmit ones of portions of the tuple to a database element (figure 6, element 66 is the database element)..."

However, Irwin lacks what Emery discloses, "...receive a nickname having a lower bit count than the associated [portion of the tuple] or packet processing data from the database element in response to one of the portions (figure 4,

element 415 and 420 are combined to be the nickname returned from the first lookup and the nickname is then received by the next lookup)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the lower bit count nickname and applying the nickname to another lookup in another stage with the rest of the method for the purpose of having higher memory utilization. The motivation for having higher memory utilization leads to a reduction in search time and complexity (Emery, col. 7, lines 55-58).

In regard to claim 15, Irwin and Emery disclose the switching interface according to claim 14. However, Emery lacks what Irwin further discloses, "the flow properties include a destination address (col. 3, Table A1, Field-Destination Address)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the flow properties having a destination address with the interface of claim 14 for the same reasons and motivation as in claim 14.

In regard to claim 16, Irwin and Emery disclose the switching interface according to claim 15. However, Emery lacks what Irwin further disclose, "the flow properties include a source address, a port, and a quality of service (col. 3, Table A1, Fields- Source Address, Service Type identifies the quality of service and col. 6, lines 64-67 where the port form the mux comes from the information in the header of the packet thus the port information is contained within the flow properties)." It would have been obvious to one with ordinary skill in the art at the

time of invention to include the flow properties having source address, a port, and a QoS with the interface of claim 15 for the same reasons and motivation as in claim 15.

In regard to claim 17, Irwin and Emery disclose the switching interface according to claim 14. However, Emery lacks what Irwin further discloses, "the received packet processing data include a plurality of packet flow information (col. 13, CAM table where it is clear that for each prefix or input to the lookup there is a plurality of packet processing data)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the packet flow information with the interface of claim 14 for the same reasons and motivation as in claim 14.

In regard to claim 18, Irwin discloses "a switching interface for a data communication switch, comprising the steps of:

means for receiving a packet (col. 10, line 66 where the incoming destination address means that a packet, as described in Table A1 in col. 3, was received);

means for forming a plurality of subtuples for the packet from flow properties associated with the packet (col. 3, Table A1 where some fields descriptive about the flow properties of the packet such as destination address, source address, etc. can be considered tuples and the different bytes of the destination address, for example, can be considered subtuples);

means for applying one or more of the subtuples as respective inputs to [a] respective one or more lookups (col. 10, lines 66-67 and col. 11, line 1 where the first byte of the destination lookup is a subtuple applied to the binary tree or lookup)...

means for returning packet processing data as an output from at least one of the lookups (col. 11, lines 2-5 where the list that is generated contains information on packet processing)."

However, Irwin lacks what Emery discloses, "...means for returning a nickname as an output from at least one of the lookups (figure 4, element 415 and 420 are combined to be the nickname returned from the first lookup), wherein the nickname has a lower bit count than the associated subtuple (figure 4, where since element 415 is null and is thus empty, the returned nickname only consists of element 420, which makes the nickname smaller than the subtuple (element 430) used to access the lookup); and means for applying the nickname as an input to at least one of the lookups (figure 4, where the nickname (415 and 420) are used to access the next lookup in the sequence)..."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the lower bit count nickname and applying the nickname to another lookup in another stage with the rest of the interface for the purpose of having higher memory utilization. The motivation for having higher memory utilization leads to a reduction in search time and complexity (Emery, col. 7, lines 55-58).

In regard to claim 21, Irwin and Emery disclose the interface according to claim 18. However, Emery lacks what Irwin further discloses, "fewer than all of the plurality of subtuples are applied as the respective inputs to the respective lookups (col. 10, lines 66-67 and col. 11, line 1 where not all of the subtuples are applied to the lookups, in this instance only the first two bytes or subtuples of the destination address are applied)." It would have been obvious to one with ordinary skill in the art at the time of invention to have not all of the subtuples applied to the inputs of the lookups with the interface of claim 18 for the same reasons and motivation as in claim 18.

Claims 5 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin (U.S. Patent 6,052,683) in view of Long et al. (U.S. Patent 6,145,064 B1).

In regard to claim 5, Irwin discloses "a method for determining packet processing data, comprising the steps of:

receiving a packet (col. 10, line 66 where the incoming destination address means that a packet, as described in Table A1 in col. 3, was received);

forming a tuple for the packet including a plurality of flow properties associated with the packet (col. 3, Table A1 where some fields descriptive about the flow properties of the packet such as destination address, source address, etc. can be considered tuples and where the combination of these tuples is simply another tuple made of the flow properties of the packet); and

applying one or more portions of the tuple to respective one or more lookups until packet processing data are returned...(col. 10, lines 66-67 and col. 11, line 1 where the destination address portion of the flow properties tuple is used as an input to the lookup; col. 11, lines 2-5 where the list that is generated contains information on packet processing)."

However, Irwin lacks what Long discloses, that is "wherein said processing data comprises a recursion indicator that prevents the application of each of the plurality of flow properties to a respective lookup (figures 2 and 8, elements 109 and 708 where a description of this bit can be read in col. 4, lines 16-24, the valid flag bit of 109 is a functional equivalent to a recursion indicator because they have the same effect, i.e. they both stop the execution of the lookup process as seen in figure 8, step 708 and on)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the recursion indicator with the rest of the method for the purpose of identifying a valid entry into the table (Long, col. 4, lines 10-15). The motivation is that if the entry is not valid no more resources or time are wasted on further lookup operations.

In regard to claim 22, Irwin discloses "a switching interface for a data communication switch, comprising:

...receiving a packet (col. 10, line 66 where the incoming destination address means that a packet, as described in Table A1 in col. 3, was received);

means for forming a tuple for the packet including a plurality of flow properties associated with the packet (figure 4, element 70 separates the various parts of the header for use; col. 3, Table A1 where some fields descriptive about the flow properties of the packet such as destination address, source address, etc. can be considered tuples and where the combination of these tuples is simply another tuple made of the flow properties of the packet); and

first means for applying one or more portions of the tuple to respective one or more lookups until packet processing data are returned...(figure 4, the connections between the components allow for a means of applying the subtuples as inputs to the lookups; col. 10, lines 66-67 and col. 11, line 1 where the destination address portion of the flow properties tuple is used as an input to the lookup; col. 11, lines 2-5 where the list that is generated contains information on packet processing)."

However, Irwin lacks a means for receiving a packet. Irwin also lacks what Long discloses, that is "wherein said processing data comprises a recursion indicator that: indicates the return of the packet processing data, and causes the first means to terminate the application of the plurality of flow properties to a respective lookup prior to the application of each of the plurality of flow properties (figures 2 and 8, elements 109 and 708 where a description of this bit can be read in col. 4, lines 16-24, the valid flag bit of 109 is a functional equivalent to a recursion indicator because they have the same effect, i.e. they both stop the execution of the lookup process as seen in figure 8, step 708 and on)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the means for receiving a packet because it is necessary to have if the system is to accept incoming data. It would have further been obvious to one with ordinary skill in the art at the time of invention to include the recursion indicator with the rest of the switching interface for the purpose of identifying a valid entry into the table (Long, col. 4, lines 10-15). The motivation is that if the entry is not valid no more resources or time are wasted on further lookup operations.

Claims 12, 13, and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin in view of Li et al. (U.S. Patent 6,567,408 B1) and further in view of Long et al.

In regard to claim 12, Irwin discloses "a method for determining packet processing data, comprising the steps of:

receiving a packet (col. 10, line 66 where the incoming destination address means that a packet, as described in Table A1 in col. 3, was received);

forming a tuple for the packet including a first subtuple identifying a first flow property associated with the packet (col. 3, Table A1 where some fields descriptive about the flow properties of the packet such as destination address, source address, etc. can be considered tuples and where the combination of these tuples is simply another tuple made of the flow properties of the packet)...

applying the first subtuple to a database element (col. 10, lines 66-67 and col. 11, line 1 where the first byte of the destination lookup is a subtuple applied to the binary tree or database element)...

However, Irwin lacks "...a second subtuple identifying a second flow property associated with the packet..."

Li however, discloses "...a second subtuple identifying a second flow property associated with the packet (col. 7, lines 32-65 where individual or any combination of the properties can be used to create a subtuple)..."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the forming of the tuples and subtuples with the applying the tuples to lookup tables for the purpose of classifying the packet. The motivation for including the forming of tuples and subtuples and applying the tuples is to provide fast, efficient classification of packets.

Lastly, Irwin and Li lack what Long discloses, that is "...returning data from the database element in response to the first subtuple, the data comprising a recursion indicator adapted to preempt application of the second subtuple to the database element (figures 2 and 8, elements 109 and 708 where a description of this bit can be read in col. 4, lines 16-24, the valid flag bit of 109 is a functional equivalent to a recursion indicator because they have the same effect, i.e. they both stop the execution of the lookup process as seen in figure 8, step 708 and on)..."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the recursion indicator with the rest of the method for the

purpose of identifying a valid entry into the table (Long, col. 4, lines 10-15). The motivation is that if the entry is not valid no more resources or time are wasted on further lookup operations.

In regard to claim 13, Irwin, Li, and Long disclose the method of claim 12. However, Irwin and Long lack "the returned data includes packet processing data." Li however, further discloses "the returned data includes packet processing data (figure 7A, elements 63'; where the classes of elements 63' are similar, if not the same, as in Tables I, II, III)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the packet processing data with the method of claim 12 for the same reasons and motivation as in claim 12.

In regard to claim 29, Irwin discloses "a switching interface for a data communication switch, comprising:

...receiving a packet (col. 10, line 66 where the incoming destination address means that a packet, as described in Table A1 in col. 3, was received);

means for forming a tuple for the packet including a first subtuple identifying a first flow property associated with the packet (figure 4, element 70 separates the various parts of the header for use; col. 3, Table A1 where some fields descriptive about the flow properties of the packet such as destination address, source address, etc. can be considered tuples and where the

combination of these tuples is simply another tuple made of the flow properties of the packet)...

means for applying the first subtuple to a database element (figure 4, the connections between the components allow for a means of applying the subtuples as inputs to the lookups; col. 10, lines 66-67 and col. 11, line 1 where the first byte of the destination lookup is a subtuple applied to the binary tree or database element)...

However, Irwin lacks "...a second subtuple identifying a second flow property associated with the packet..."

Li however, discloses "...a second subtuple identifying a second flow property associated with the packet (col. 7, lines 32-65 where individual or any combination of the properties can be used to create a subtuple)..."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the receiving of packets and forming of the tuples and subtuples with the applying the tuples to lookup tables for the purpose of classifying the packet. The motivation for including the forming of tuples and subtuples and applying the tuples is to provide fast, efficient classification of packets.

Lastly, Irwin and Li lack what Long discloses, that is "means for returning data from the database in response to the first subtuple, the data comprising a indicator adapted to indicate the presence, in the data, of: a nickname to be applied as an input into the database with the second subtuple, and packet processing data to preempt application of the second subtuple to the database

(figures 2 and 8, elements 109 and 708 where a description of this bit can be read in col. 4, lines 16-24, the valid flag bit of 109 is a functional equivalent to an indicator because they have the same effect, i.e. they both stop the execution of the lookup process as seen in figure 8, step 708 and on, it should also be noted that the presence of valid data suggests the presence of a nickname as described in Irwin and Li)..."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the recursion indicator with the rest of the method for the purpose of identifying a valid entry into the table (Long, col. 4, lines 10-15). The motivation is that if the entry is not valid no more resources or time are wasted on further lookup operations.

In regard to claim 30, Irwin, Li, and Long disclose the interface of claim 29. However, Irwin and Long lack "the returned data includes packet processing data." Li however, further discloses "the returned data includes packet processing data (figure 7A, elements 63'; where the classes of elements 63' are similar, if not the same, as in Tables I, II, III)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the packet processing data with the interface of claim 29 for the same reasons and motivation as in claim 29.

In regard to claim 31, Irwin, Li, and Long disclose the interface of claim 29. However, Irwin and Li lack what Long further discloses, that is "the returned data

includes the nickname to be applied as an input into the database with the second subtuple (col. 4, lines 24-33, it should be noted that although Long is describing a page number comparison, the page number retrieved from the table itself is still data and could be considered a type of nickname, further the act of applying the nickname as an input to a database with the second subtuple is an intended use of the nickname and the general concept of applying a subtuple to a database has been described in Irwin, see claim 29)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the returned data including the nickname with the interface of claim 29 for the same reasons and motivation as in claim 29.

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter: Claims 8-11 and 25-28 are allowable because the prior art of record fails to teach, in combination with other claim limitations, "...inputting a second lookup key including a second portion of the tuple and the nickname..."

Response to Arguments

Applicant's arguments with respect to claims 5, 12, 13, 22, and 29-31 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua Kading whose telephone number is (703) 305-0342. The examiner can normally be reached on M-F: 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Olms can be reached on (703) 305-4703. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joshua Kading
Examiner
Art Unit 2661

June 16, 2004

KENNETH VANDERPUYE
PRIMARY EXAMINER